

Claims

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3 1. A method, including steps of
4 determining first values for a set of parameters for a communication link, in
5 a first layer of an OSI model communication system;
6 sending information using said first values;
7 obtaining information regarding characteristics of said communication link;
8 and
9 adjusting said first values in response to said information, whereby further
10 use of said communication link is responsive to said steps of adjusting.

11
12 2. A method is in claim 1, wherein said first values include at least two
13 of: an antenna selection value, a power level value, a channel selection value, a modula-
14 tion type value, a symbol rate value, an error code type value, a set of equalization values.

15
16 3. A method as in claim 1, including steps of
17 determining alternative values for said set of parameters for a second com-
18 munication link in said communication system;
19 sending information using said second communication link;
20 obtaining alternative information regarding characteristics of said second
21 communication link; and

1 adjusting said alternative values in response to said alternative information,
2 whereby further use of said second communication link is responsive to said steps of ad-
3 justing.

4
5 4. A method as in claim 3, wherein said steps of adjusting said alterna-
6 tive values are responsive to a result of said steps of adjusting said first values.

7
8 5. A method as in claim 3, wherein said steps of determining alternative
9 values are responsive to a result of said steps of determining first values.

10
11 6. A method as in claim 1, including steps of
12 determining second values for a set of parameters for communication link,
13 in a second layer of said communication system;
14 adjusting said second values and responses said information; and
15 wherein said steps of sending information use said second values.

16
17 7. A method is in claim 6, wherein
18 said first layer includes a media access layer; and
19 said second layer includes at least one of: a physical layer, a network layer,
20 a transport layer, an application layer.

21
22 8. A method is in claim 6, wherein
23 said first layer includes a physical layer; and

1 said second layer includes at least one of: a media access layer, a network
2 layer, a transport layer, an application layer.

3
4 9. A method is in claim 1, wherein said second values include at least
5 one of: a message size value, a set of acknowledgment and retransmission values, a TDD
6 duty cycle value.

7
8 10. A method as in claim 1, wherein said steps of adjusting include
9 determining second values in response to said information; and
10 combining said first values and said second values;
11 whereby said first values are adjusted in response to a result of said steps of
12 combining.

13
14 11. A method is in claim 10, wherein said steps of combining include
15 adaptively altering said first values using at least one hysteresis parameter.

16
17 12. A method is in claim 1, wherein said steps of determining are re-
18 sponsive to a higher-level layer in said communication system.

19
20 13. A method is in claim 12, wherein
21 said first layer includes a media access layer; and

1 said second layer includes at least one of: a network layer, a transport layer,
2 an application layer.

3
4 14. A method is in claim 12, wherein
5 said first layer includes a physical layer; and
6 said higher-level layer includes at least one of: a media access layer, a net-
7 work layer, a transport layer, an application layer.

8
9 15. A method, including steps of
10 dynamically determining characteristics of a communication link between a
11 first device to a second device;
12 dynamically sending first information regarding said characteristics from
13 said first device to said second device;
14 receiving said information at said second device;
15 dynamically sending second information between said first device and said
16 second device using said characteristics, in response to said first information.

17
18 16. A method as in claim 15, wherein said communication link includes
19 a wireless communication link.

20
21 17. A method as in claim 15, wherein said communication link includes
22 a time division multiple access communication link.

1 18. A method as in claim 15, wherein

2 said first information includes a plurality of said characteristics, each one of
3 said plurality of characteristics possibly being different from each other one of said plu-
4 rality of characteristics;

5 each one of said plurality of characteristics being specific to one said sec-
6 ond device of a plurality of said second devices.

7
8 19. A method as in claim 15, including the steps of

9 choosing a timebase to allow for link adaptation in such a way that said
10 chosen time base is independent of the said communication link parameters;

11 fragmentation and reassembly of data units in such a way that the fragment
12 size (measured in ticks) remains constant regardless of the nature of said communication
13 link parameters.

14
15 20. A method as in claim 15, wherein

16 said communication link parameters are responsive to the relative frequency
17 with which packets are dropped, rather than responsive to various other measurements.

18
19 21. A method as in claim 15, wherein

20 said communication link includes a portion of a duplex communication link,
21 said duplex communication link having a structure including sequential frames;

1 said first information is sent from said first device to one or more said sec-
2 ond devices during a designated frame of said duplex communication link;

3 said first information is used to control said steps of dynamically sending
4 second information during said same designated frame of said duplex communication
5 link.

6 22. A method as in claim 21, wherein
7 said sequential frames include frame descriptor packets that describe the
8 contents of the next said sequential frame.

9
10 23. A method as in claim 21, wherein
11 said duplex communication link includes, for each said frame, a down-
12 stream portion and an upstream portion;

13 said first information is sent during said downstream portion of said desig-
14 nated frame;

15 said steps of dynamically sending include sending information during said
16 downstream portion of said same designated frame or said upstream portion of said same
17 designated frame.

18
19 24. A method as in claim 15, wherein
20 said communication link includes a sequence of frames, each having a map
21 section and one or more payload elements;

1 said first information is sent during said map section of a designated frame;

2 and

3 said steps of dynamically sending include sending information during said
4 payload elements of said same designated frame.

5
6 25. A method as in claim 15, wherein

7 said steps of dynamically sending include requesting upstream bandwidth in
8 such a way that the number of said payload elements is expressed as a number of bytes
9 rather than a number of packets.

10
11 26. A method as in claim 15, wherein

12 the step of dynamically sending includes sending a Sync packet that syn-
13 chronizes said first device and said second device.

14
15 27. Apparatus including

16 means for dynamically determining characteristics of a communication link
17 between a first device to a second device;

18 means for dynamically sending first information regarding said characteris-
19 tics from said first device to said second device;

20 means for receiving said information at said second device;

means for dynamically sending second information between said first device and said second device using said characteristics, in response to said first information.

28. Apparatus including

a first device capable of sending information to a second device using a communication link;

said first device being capable of dynamically determining characteristics of said communication link for use in communicating with said second device;

said first device being capable of formatting first information for sending to said second device regarding said characteristics, and capable of at least one of (a) formatting second information for sending to said second device using said characteristics, or (b) receiving information from said second device using said characteristics.

29. Apparatus as in claim 28, wherein said first device includes a transmitter for sending information using a wireless communication link.

30. Apparatus as in claim 28, wherein said first device includes a timer for sending or receiving information using a time division multiple access communication link.

1 31. In a method for sending information between a first device to a sec-
2 ond device, a data structure including a frame in a sequence of frames for transmission,
3 each said individual frame including

4 first information regarding characteristics of a communication link between
5 said first device and said second device;

6 second information for communication between said first device and said
7 second device, said second information using said characteristics from said same individ-
8 ual frame.

9
10 32. A data structure as in claim 31, wherein said communication link in-
11 cludes a wireless communication link.

12
13 33. A data structure as in claim 31, wherein said communication link in-
14 cludes a allocated duration of time within said same individual frame.

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16 34. A data structure as in claim 31, wherein said frame includes a time
17 division multiple access communication link.

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19 35. A data structure as in claim 31, wherein said first information in-
20 cludes a plurality of said characteristics for a corresponding plurality of said communica-
21 tion links between said first device and a corresponding plurality of said second devices.